

INDUSTRIAL HYGIENE INFORMATION AND REGULATORY ACTIONS SUMMARY January 2001

REGULATORY ACTIONS

OSHA Proposed Rules - None

OSHA Adopts Injury, Illness Recording Rule Completing Revision Initiated in Late 1980s

Amid a flurry of last-minute regulatory actions, the Occupational Safety and Health Administration Jan. 19 adopted far-reaching recordkeeping regulations affecting how nearly 1.3 million work sites record their employees' injuries and illnesses (66 FR 5915).

The final rule updates three OSHA forms used by employers to list and detail workplace injuries and illnesses and will simplify the overall recordkeeping system for employers, according to Charles N. Jeffress, OSHA's administrator. Jeffress told reporters Jan. 18 that the new requirements will go into effect on Jan. 1, 2002.

The nation's employers have had to keep records on workplace cases since the early 1970s, following passage of the Occupational Safety and Health Act, which directed the Labor Department to create a national system for collecting injury and illness data. Employers use the data to respond to BLS surveys. Additionally, employers are required to make the records available during an OSHA inspection.

The revised requirements make substantive changes in how employers determine whether an injury or illness is work-related and therefore recordable. The new rule includes new definitions of medical treatment, first aid, and restricted work, all aimed at simplifying employer decision making, according to the rule. An injury or illness must be logged on the OSHA form if it results in medical treatment beyond first aid, results in a fatality, triggers days away from work, or results in restricted work or transfer to another job. Loss of consciousness or the diagnosis of a significant injury or illness by a health care professional also must be recorded as work-related, the rule says.

For additional information, contact Jim Maddox at OSHA's Directorate of Safety Standards Programs, Room N-3609, 200 Constitution Ave. N.W., Washington, D.C. 20210; (202) 693-1999. The documents are available from OSHA's web page at www.osha-slc.gov/recordkeeping/index.html.

Needlestick Safety Rule Adopted

OSHA adopted the final rule on Jan. 18 (66 FR 5318). Implementation of the rule will reduce the number of accidental needlesticks and sharps injuries sustained by health care workers. The revisions to the bloodborne pathogen standard were required by the Needlestick Safety and Prevention Act (P.L. 106-430). Because of that congressional mandate, OSHA is exempt in this instance from the procedural requirements to issue a notice of proposed rulemaking before issuing the final rule. The amended standard is effective April 18.

The bloodborne pathogen standard is directed at doctors, dentists, nurses, lab technicians, emergency medical technicians, firefighters, nursing home workers, and others. It also applies to "any employee with a duty to render some form of medical care." Thus, companies that designate personnel as "first responders" must comply with the standard.

OSHA estimates the number of injuries involving contaminated sharps in hospitals and non-hospital health care settings at 590,164 per year. The General Accounting Office found that the switch to safer devices would prevent about 69,000 needlestick injuries each year.

OSHA estimates compliance with the rule will cost employers \$34 million. The total includes an estimated \$32.6 million for soliciting and documenting employee input into the exposure control plan and \$1.3 million to maintain sharps injury logs. This breaks down to \$67 per establishment per year, the agency said.

The revisions to OSHA's bloodborne pathogen standard require hospitals and other health care facilities to:

- Identify and provide safer sharps systems, which includes needles and blades.
- Maintain sharps injury logs and involve health care workers in the selection of safer technologies.
- Account for innovations in procedure and technological developments that reduce the risk of exposure incidents," such as newly available medical devices. This includes a requirement that employees be involved in selecting safer devices. This participation must be documented in the employer's exposure control plan, OSHA said.
- Update the exposure control plan annually.

The final rule clarifies and adds additional terms to the standard.

- The final rule also includes the term "sharps with engineered sharps injury protection". These are "a nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident." Examples of sharps devices are:
 - ✓ syringes with a sliding sheath that shields the attached needle after use;
 - ✓ needles that retract into a syringe after use; and
 - ✓ shielded or retracting catheters used to access the bloodstream for intravenous administering of medication or fluids.
- The rule also includes the term "needleless system," which is defined as a device that does not use needles for:
 - ✓ collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established;
 - ✓ the administration of medication or fluids; or
 - ✓ any other procedure involving the potential for occupational exposure to bloodborne pathogens due to cuts from sharps.
- The revised standard defines engineering controls as "all control measures that isolate or remove a hazard from the workplace." The definition specifically includes devices and controls that are not medical devices, "such as sharps disposal containers and biosafety cabinets."

The OSHA deadline for comments is March 19. Send the comments to the OSHA Dockets Office, Room N-2625, U.S. Department of Labor, 200 Constitution Ave. N.W., Washington, D.C. 20210. Additional details are available at: www.osha-slc.gov/needlesticks/index.html

OSHA's Semiannual Regulatory Update

Prerule Stage

- Occupational Exposure to Ethylene Oxide (Section 610 Review)
- Process Safety Management of Highly Hazardous Chemicals
- Occupational Exposure to Perchloroethylene

Proposed Rule Stage

- Safety and Health Programs (for General Industry & the Maritime Industries)
- Occupational Exposure to Hexavalent Chromium (preventing Occupational Illness: Chromium)

- Permissible Exposure Limits for Air Contaminants
- Plain Language Revisions to Spray Applications

Final Rule Stage

- Walking Working Surfaces and Personal Fall Protection Systems (1910) (Slips, trips and fall prevention)

Long Term Actions

- Respiratory Protection (proper use of Modern Respirators)
- Indoor Air Quality in the Workplace
- Occupational Exposure to Beryllium
- Accreditation of Training Programs for Hazardous Waste Operations

OSHA ACTIVITIES

Raymond Davis Layne Appointed Interim OSHA Head.

Layne is a career OSHA official and has worked at the job safety agency since its inception in 1971. Jeffress named him to one of two deputy administrator positions in March 1999. For nearly a decade before that appointment, Layne was regional administrator for OSHA's Region IV office in Atlanta, which covers southeastern states

OSHA Reminds Employers to Post Injury, Illness Data

During the month of February, employers with 11 or more employees must post a summary of the total number of job-related injuries and illnesses that occurred in 2000, said OSHA.

The summary must remain posted from Feb. 1 to March 1, 2001.

Since 1972, employers have been required to post the annual totals of the information contained at the right-hand portion of the OSHA Form 200, "Log and Summary of Occupational Injuries and Illnesses."

The form must be displayed wherever notices to employees are usually posted. The right-hand portion of the OSHA Form 200 includes information on type of injury and illness, extent and outcome. This information alerts employees to potential hazards.

Employees, former employees and their designated representatives and OSHA officials have the right to access the entire Form 200.

OSHA said companies with no injuries and illnesses in 2000 must post the form with zeros on the total line.

The person who prepares the annual summary must certify that the totals are correct and sign the form.

Employers must make a copy of the summary available to employees who move from worksite to worksite, such as construction workers, and employees who do not report to any fixed establishment on a regular basis, the agency noted.

Employers with 10 or fewer employees and employers in certain industry groups are normally exempt from federal OSHA injury and illness recordkeeping and posting requirements.

Ergonomics Standard

On January 16, barring the very real possibility that a federal court will intervene before that date to block it, OSHA's long-awaited, long-dreaded ergonomics standard took effect. The immediate result will be nothing much at all. Long term, the standard promises to boost the sales of some ergonomic products--recordkeeping and training software in particular--and to keep both opposing lawyers and health care professionals busy.

The standard gives physicians and other licensed health care professionals (HCPs) a key role in the ergonomic programs launched by general industry employers who have at least one worker reporting symptoms of a musculoskeletal disorder. To trigger action required by the standard, that MSD must be work-related, it must require lost days or restricted work or treatment beyond first aid, and its symptoms must be work-related and must last for at least seven consecutive days *after* the employee reports them. The employer must examine that job using a Basic Screening Tool provided by OSHA. If the risk factors of force, awkward posture, repetition, vibration, or contact stress are present at the levels described in the tool, only two options are available: a Quick Fix of controls for the job's hazards within 90 days, or implementation of a full ergonomics program. This is where the HCPs come in.

OSHA says giving the employee access to a health care professional is an essential element of the required MSD management process at this stage. The other essential elements are "any necessary work restrictions, including time off work to recover," work restriction protection, and evaluation and follow-up of the MSD incident. It's the work restriction provision that brought an immediate lawsuit from the U.S. Chamber of Commerce and the Society for Human Resource Management, although both organizations also consider the entire standard flawed and too costly. "One of the more troubling aspects of the regulations from a business standpoint is that it calls for a 90 percent federally mandated wage replacement for employees removed from work due to an MSD and 100 percent wage replacement for those workers placed on restricted or light duty work. The (Labor) Department provides no guidance to employers in the regulations on how to rationalize this wage replacement requirement with state workers' compensation," SHRM said in its announcement of the suit, which was filed November 14 in the conservative U.S. Court of Appeals for the District of Columbia Circuit.

Labor unions promised to fight for the standard. Stephen P. Yokich, the UAW's president, also vowed to strengthen the standard by making it proactive. "We expect the opponents of this protection, such as the National Association of Manufacturers and the Chamber of Commerce, to try to block progress by lawsuits. The UAW will do what is necessary to defend this standard," Yokich said.

"Ergonomics problems caused by repetitive motion and overexertion lead to the majority of work injuries among UAW members. Our union has negotiated extensive ergonomics programs with many employers, and we greatly improved our agreements with the auto companies in the most recent industry negotiations."

Key Provisions in the Standard

OSHA's final regulatory text of the standard tightens some definitions from the November 1999 draft and contains a few new features.

The employee experiencing an MSD can obtain a second HCP's opinion, and if he and the employer's professional don't agree, a third HCP's opinion must be obtained to settle it. Unchanged is the requirement that an affected employee must get 90 percent of his earnings if off work (100 percent if working light duty), but the final text says this must continue for 90 calendar days--not six months, as in the draft.

Unlike the draft, the final text defines MSDs as disorders of specific body parts. It specifically says discomfort is not an MSD symptom and that the occurrence of an MSD in a "problem job," as the standard defines it, is not a violation of the standard. In a significant change, the final standard applies to all general industry employers with 11 or more workers, including part-time employees--not just to manufacturing and manual handling jobs. Also, the final standard gives employers four years to effect their initial compliance with the standard. After that, they have two years to implement the permanent controls that reduce MSD hazards in problem jobs. The draft provided one year.

Also new is this part of the definition of "work restrictions": "For the purposes of this standard, temporarily reducing an employee's work requirements in a new job in order to reduce muscle soreness resulting from the use of muscles in an unfamiliar way is not a work restriction. The day an employee first reports an MSD is not considered a day away from work, or a day of work restriction, even if the employee is removed from his or her regular duties for part of the day."

CONGRESSIONAL ACTIONS OF INTEREST

Elaine Chao Named to Labor Secretary Post

President-elect George W. Bush tapped Elaine L. Chao, a fellow at the Heritage Foundation and the former chief executive officer of United Way of America, for labor secretary after Linda Chavez, his initial nominee, withdrew. Both the labor and business communities welcomed Chao's nomination.

Make Worker Safety 'Core Value,' Advisory Group Tells New Administration

An advisory group for federal worker safety voted Jan. 11 to recommend that the new administration establish worker protection, pollution prevention, and environmental stewardship as "core management values throughout the federal government."

The Federal Advisory Council on Occupational Safety and Health voted unanimously and suggested that president-elect Bush act on the idea within the first 100 days of his presidency.

The draft memo will ask each agency head to:

- conduct a baseline assessment of the department's occupational safety, health, and environmental management programs, systems, and organizations
- identify weaknesses,
- identify actions to address the weaknesses, and
- estimate how much it would cost to make that federal agency "a model for the nation's employers."

The FACOSH workgroup that proposed the idea noted its draft memo is "similar in both tone and content" to one issued by Vice president-elect Dick Cheney in 1980 while he was Secretary of Defense.

One of the "talking points" of the memo suggests that Bush tackle the issue because although injury/illness rates and toxic emissions are falling in the private sector, "the federal government has not shared fully in this progress."

Federal workers are six times as likely as the best private sector employers to sustain lost time injuries and illnesses, according to a Conference Board study conducted in 2000 that was cited by the FACOSH workgroup. In addition, federal agencies are 20 percent to 30 percent more likely than private industry to be in significant non-compliance with environmental regulations, the group said.

If the federal government was able to perform as well as the best private companies, the government would reduce injuries and illnesses by 59,000 and save taxpayers more than \$1.7 billion a year in future compensation costs and productivity losses, the group estimated.

The FACOSH subgroup that proposed the draft memorandum is comprised of executives from several federal agencies and unions as well as private sector experts. Federal agencies represented in the workgroup include the departments of Health and Human Services, Interior, Veterans Affairs, Defense, Labor, the U.S.

Postal Service, National Aeronautics and Space Administration, and the Environmental Protection Agency.

President Bush Orders 60-day Delay of New Rules

President Bush issued an order prohibiting regulatory agencies from issuing any new rules, and delaying, for 60 days, the effective dates of rules issued rules. This order affects six final rules. Two new OSHA rules, the Ergonomics Standard and the Bloodborne Pathogens Standard are not affected by the 60-day delay.

The six rules affected are:

- OSHA's new standard to ensure safer methods of erection for structural steel, which was published in the Federal Register on Jan. 18 and will now go into effect on September 15, 2001.
- OSHA's revised Recordkeeping Standard, goes into effect on March 2, 2002. The new recordkeeping standard includes provisions for recording musculoskeletal disorders and needlestick injuries, in accordance with the new Ergonomics Standard and the amendments to the Bloodborne Pathogens Standard. It includes a clarification of the definitions of light-duty work; recording of light duty work, and it includes new requirements concerning employee access to recordkeeping information.
- Two new MSHA rules, which compel mine owners to reduce the level of diesel particulate pollution in the air that mineworkers breathe, will be delayed until May 20, 2001.
- A set of amendments to OSHA's cotton dust standard, which had been scheduled to go into effect on April 6, 2001, may go into effect 60 days later, but as a result of the way that the rules were issued, they could be delayed indefinitely if employers (or the Bush administration) raise substantial objections to them.
- Similarly, an MSHA Hazard Communication Standard will go into effect 60 days later than scheduled, on December 3, 2001, unless employers or the Bush administration decide to raise substantial objections to it, in which case it could be delayed indefinitely.

Bush Administration To Reopen Diesel Fuel Rule

The Bush Administration announced that it would review diesel sulfur and clean engine standards imposed by the Clinton-run EPA, postponing the regulation's effective date for 60 days.

Speaking at her Senate confirmation hearing, newly named EPA Administrator Christine Todd Whitman said she "has an obligation to review all the rules," issued by the agency under the Clinton Administration.

Trade groups representing oil refining and engine manufacturing companies are optimistic the review could lead to relaxed standards.

Under the rules, the amount of sulfur in diesel fuel would be drastically reduced by 97 percent in 2006, enabling new-generation diesel engines to run cleaner and meet established 2007 emissions standards.

The EPA said the standards were justified to address the growing public health concern that particulate matter in diesel exhaust is a major cause of respiratory problems.

TECHNICAL ARTICLES OF INTEREST

Ergonomics Rule Faces Hurdles

More than 60 business groups and individual companies filed suit against OSHA in federal courts around the country, all the cases were consolidated into a single action in a federal circuit court chosen by lottery. Some of the opposing points in the litigation are: (1) there is no scientific support for the standard, (2) the rule is too vague, (3) it rests on a fatally flawed economic analysis and (4) OSHA committed serious procedural violations of the Administrative Procedures Act. OSHA's Administrator Charles Jeffress stated, "I expect that our new standard will be tied up in litigation for at least another year."

OSHA's Ergonomic Rule Timeline

- 11/14/00 OSHA issues final ergonomic rule
- 1/16/01 Final rule becomes effective
- 10/15/01 Employers must provide all employees with information about signs and symptoms of common MSDs, the importance of early reporting, risk factors, and a short description of the standard.
- by 1/16/02 Deadline to establish work restrictions protection for grandfathered program
- by 1/18/05 Or two years after a job meets the Action Trigger, whichever comes later, implement permanent controls.

Once an employee has experienced an MSD incident:

- Within seven days, employer must determine whether the job meets the standard's Action Trigger.

If the job does meet the Action Trigger, the employer must:

- Within 7 days initiate MSD management
- Within 30 days initiate management leadership and employee participation

- Within 45 days train employees in setting up and managing ergo program
- Within 60 days initiate job hazard analysis
- Within 90 days implement initial controls

ACGIH Approves Recommended TLV for Hand Activity

The board of the American Conference of Governmental Industrial Hygienists has ratified a threshold limit value for hand activity, which is intended as a recommendation for industrial hygienists. The new hand activity TLV is an "added source of information specific to ergonomics."

The ACGIH threshold limit value for average hand activity level is set at four hours or more, based on repetition and normal peak force. The exposure limit is directed at the use of the hand, wrist, and forearm, and is intended for "mono-task" jobs performed for four or more hours a day, according to the draft document prepared by the committee. The TLV defines a mono-task job as one in which a similar set of motions or exertions is performed repeatedly, "such as working on an assembly line or using a keyboard and mouse."

That TLV is essentially the same as one of the OSHA risk factors for hand activities such as keying or using a mouse for more than four hours total in a workday. The recommendation is based on epidemiological, psychophysical, and biomechanical studies, Millea said. The next step for ACGIH is to make the TLV public, she said, adding that it is now available on the organization's web site.

A committee official told BNA in August 2000 that a TLV establishes a threshold level at which adverse health effects can be expected. He told BNA that the TLVs are recommendations and are not intended to have the force of regulation. It is assumed that the values will be "used by an informed person to make reasonable and prudent judgments in the workplace". Certain industry observers have expressed concern that, if OSHA's controversial standard is stayed or overturned because of litigation or the action under the Congressional Review Act, voluntary standards and the TLV could become "a de facto standard".

Copies of the "Hand Activity Level: TLV-PA Documentation" are free for a limited time and available at the ACGIH web site, <http://www.acgih.org/store/>.

Tips on Fall Protection Offered by NIOSH

A publication offering tips to help employers design comprehensive fall-protection programs is now available, the National Institute for Occupational Safety and Health announced Jan. 2. Falls surpassed workplace homicides in 1999 to become the second leading cause of work-related death after motor vehicle crashes, according to government figures. Worker Deaths by Falls: A Summary of Surveillance Findings and Investigative Case Reports, DHHS (NIOSH) Publication No. 2000-116, is designed for employers and workers as well as safety professionals, NIOSH said.

The publication provides "a practical on-site resource for assessing individual workplaces, identifying risk factors for falls, and developing effective preventive measures," NIOSH said.

The research institute recommended that employers at a minimum incorporate safety in work planning, identify all fall hazards at a work site, conduct safety inspections regularly, train employees to recognize and avoid unsafe conditions, and provide workers with appropriate protective equipment and train them in its use. The publication is available from the NIOSH toll-free information number 800-356-4674.

Slips & Falls on the Manufacturing Floor

(Refer to Occupational Health & Safety, Jan. 2001)

According to the National Institute for Occupational Safety and Health (NIOSH, 1998), more than one million people annually cause serious injury to themselves by slipping and falling. In 11,000 of those cases, the injuries are serious enough to result in death! The lifetime costs associated with these accidents is \$12.6 Billion in the United States (The National Safety Council's 1999 Injury Facts).

Applying floor treatment products is a form of reducing slipperiness by enhancing floor traction, though most floor treatments do not provide the service that they promote. Some even go as far as to say that their product is meeting or exceeding the standards or requirements of OSHA, when in actuality there is no OSHA standard to floor treatment.

What to do, if contemplating the buying and use of a floor treatment product?

Test a few carefully selected products on one's own floor.

1. Create a list of products that are designed for use on your particular floors with your particular traffic demands, such as:
 - a. Type of floor (marble, wood, concrete, etc)
 - b. Location (lobby, factory, etc)
 - c. Amount of traffic
2. Study this handful of products in terms of their ease of application. Do products require or are they:
 - a. Professional application
 - b. Self application
 - c. Regular maintenance
 - d. Easy to apply
3. Pick those you can apply and maintain given the resources at your disposal.

4. Conduct a patch test of the few products you have selected based on the above parameters. (Recommendation-hire a professional who is experienced in using the tri-bometer (or slipmeter)).
5. Using the best-tested products, conduct a 30-day trial on a selected area of your floor surface.
6. Get results by monitoring any changes in slip incidents by:
 - a. Feedback from employees
 - b. Retesting using slipmeter
 - c. Slip incidents
7. Test the last few products for a 90-day trial period
8. Pick the product that works the best!

Lockout/Tagout

OSHA's lockout / tagout standard affects an estimated 3 million workers. It is the second most frequently cited standard by OSHA. The agency is considering a similar standard for the construction industry, where 4 million workers may be exposed.

The top five lockout / tagout violations from 10/1/99 to 9/10/00 are:

1. 1910.147(c)(4)(i)... "Procedure shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section."
2. 1910.147(c)(1)... "The employer shall establish a program consisting of energy-control procedures, employee training and periodic inspections to ensure that, before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start-up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative."
3. 1910.147 (c)(7)(i)... "The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by employees."
4. 1910.147(c)(6)(i)... "The employer shall conduct a periodic inspection of the energy-control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed."
5. 1910.147(c)(4)(ii)... "The procedure shall clearly and specifically outline the scope, purpose, authorization, rules and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including,

but not limited to, the following: (A) a specific statement of the intended use of the procedure; (B) specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy; (C) specific requirements for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and (D) specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices and other energy control measures."

Making Sense of Hand Protection

Average hand injuries costs are \$6,427 per incident (National Safety Council's 1999). OSHA standard 1910.138 requires employees to wear hand protection when exposed to hazards. The standard requires employers to select hand protection based on an evaluation of the performance characteristics of hand protection in relation to the tasks performed, duration of use, and hazards present.

To evaluate hand protection for the appropriate recommended use, the employer shall use a glove manufacturer survey and a comparative analysis to select the proper glove. The comparative analysis should measure costs in regards to wear ratio. For example if a consumer has a choice between two pairs of gloves, with glove A costing \$5 with a 30 day use, and glove B costing \$6 with a 60 day use, glove B would be the better buy. Glove B gives more for the money - four dollars less for 30 more days of use.

There are five major product categories of gloves. They are:

Category	Strength	Weakness
Leather	Abrasion resistant, Breathable	Easy to cut
Cotton	Comfortable, Breathable	Minimum protection
Supported	Excellent wear ratio to cottons, Good fit, chemical and solvent protection	Limited breathability, Extra perspiration, Limited breathability, Extra perspiration
Unsupported	Greater dexterity plus chemical protection	Minimum cut or abrasion protection
Strings	Low cost, general purpose, Cut resistance	No liquid protection, Very limited thermal properties

For a complete source of further information, contact Occupational Health & Safety, January 2001, www.ohsonline.com

Strong Link Between Work, Injuries Found in Two-Year Science Academy Study

A National Research Council report has concluded that work-related exposures directly contribute to carpal tunnel syndrome and other musculoskeletal disorders and that some specific approaches to reducing symptoms "are effective when properly implemented," according to a copy obtained by BNA Jan. 17.

The federal study--nearly two years in the making-- did not directly support the specific approach taken by the Labor Department in issuing an ergonomics rule in November 2000 aimed at reducing musculoskeletal disorders in millions of workplaces. However, the report prepared by a National Academy of Sciences panel concludes that some of the same "elements" of that federal rule, such as provisions that require worker involvement and management commitment to solving ergonomic problems, have successfully alleviated pain associated with musculoskeletal disorders.

The report, *Musculoskeletal Disorders and the Workplace*, was released Jan. 18. The report cautioned that "no single strategy is or will be effective for all types of industry," and largely sidestepped the issue of whether a federal rule would be the best approach to reducing musculoskeletal injuries. The panel said that efforts to reduce repetition and other factors "are best tailored to the individual situation" faced by each worker. It cautioned that further study is needed on a host of fronts, including how to measure the "dose" of exposure a worker receives when doing repetitive work. The report said current research "has been constrained" by the inability to measure and compare such a dose, which is a common measurement for other workplaces hazards such as noise and chemicals. The report also recommended more specific reporting by the Labor Department's Bureau of Labor Statistics on the details surrounding musculoskeletal injuries, including risk factors.

The NRC report said musculoskeletal disorders are a costly national health problems, accounting for nearly 70 million physician office visits in the United States each year. Conservatively, such injuries cost the nation between \$45 billion and \$54 billion a year through lost wages, workers' compensation, lost productivity, and other impacts, it said.

Copies of the report, *Musculoskeletal Disorders and the Workplace*, are available from the National Academy Press, 2101 Constitution Ave. N.W, Washington, D.C. 20418; 800-624-6242 or (202) 334-3313. The report can also be read online at www.nap.edu/catalog/10032.html.

No Association Found Between Cellular Phone Use and Risk of Brain Tumors

Researchers at the National Cancer Institute (NCI) found that people who used cellular phones did not have an increased risk of brain tumors compared to non-users. The study, published in the Jan. 11, 2001, issue of the *New England Journal of Medicine* (NEJM)*, was released on Dec. 19.

The use of hand-held cellular phones involves placing a small transmitter that emits radio frequency radiation next to the head. There has been widespread public concern that this radiation might cause tumors of the brain and nervous system. Because it is not known whether the radiation from cell phones poses a cancer risk, NCI scientists included cell phone use as part of a comprehensive study on the causes of brain tumors that began in 1994.

The NCI adult brain tumor study involves about 800 adult brain tumor cases and 800 controls (people without brain tumors) from three medical institutions in Phoenix, Boston, and Pittsburgh. Data collection was done by a structured personal interview in which participants were asked specific questions about when they first began using a hand-held cellular phone, date of last use, and the usual level of use. Information about the specific make or model of the phone was not collected. Data collection was completed in 1998.

The researchers found no evidence that a person's risk of developing a brain tumor increased with increasing years of use or average minutes of use per day, nor did brain tumors among cellular phone users tend to occur more often than expected on the side of the head on which the person reported using their phone. Among high-level users were participants who used the phones for an average of 15 or more minutes per day for at least three years. Very few people used their phone frequently for more than five years.

"We don't see any evidence that cell phones cause brain tumors," said Peter D. Inskip, Sc.D., principal investigator for the study from NCI's Division of Cancer Epidemiology and Genetics in Bethesda, Md. "But if an increased risk of brain tumors occurs only after five or more years, or only among very heavy users, this study probably would not detect it."

The NCI study began in 1994 and was completed in 1998, during a time when analogue phones were primarily used. Digital phones, which operate at a higher frequency, are more commonly used today. However, there is no evidence at this time that cancer risk would differ for the two types of phones.

Similar results were seen in two other studies. One published in the *Journal of the American Medical Association* by Muscat *et al*, involved 469 brain tumor cases and 422 controls. The researchers did not find an association between use of hand-held cellular telephones and the risk of glioma, the most common form of brain cancer in

adults. A 1999 Swedish study by Hardell *et al*, involving 233 brain tumor cases and 466 controls, also did not find an association between the amount of cell phone use and the risk of brain tumors. The investigators reported an association between side of the head on which the tumor occurred and side of phone use, but this was based on a small number of brain tumor cases.

There are three other types of wireless or mobile phones currently on the market – car cellular phones, transportable cellular phones, and cordless phones. All of these involve much lower radiation exposure to the brain. With car cellular phones, the antenna is mounted on the outside of the car some distance from the user. Transportable cellular phones, or “bag phones,” have a transmitter with the battery pack in a portable unit separate from the handset. Cordless phones have a base unit wired to the land-line telephone service and typically operate at a lower frequency and much lower power than cellular phones. If hand-held cellular phones do not cause brain tumors, it would be surprising if these other types of wireless phones do, because of the lower level of radiation exposures.

The number of people using cell phones has increased dramatically during the past 10 years, and this trend appears likely to continue. According to the Cellular Telecommunications Industry Association, there are currently about 107 million cellular phone subscribers in the United States, increasing at a rate of about 2 million per month.

Because of the large number of users worldwide, there are several other studies in progress involving cell phones and brain tumors. The largest of these is a multicenter, international case-control study involving about 3,000 cases and 3,000 controls, coordinated by the International Agency for Research on Cancer (IARC), based in Lyon, France. Results are expected in several years. A Danish study, which includes a cohort of 550,000 cellular phone subscribers from 1982 to 1995, is expected to be published soon.

In addition, a \$10 million program on cell phone research was recently announced in the United Kingdom. In the United States, the Food and Drug Administration (FDA) and the Cellular Telecommunications Industry Association (CTIA) have recently signed a Cooperative Research and Development Agreement (CRADA), which stipulates that FDA will provide scientific and technical guidance for studies which evaluate the health effects of cellular phone use.

Because the causes of brain tumors are largely unknown, NCI scientists conducting the adult brain tumor study are evaluating a wide range of environmental, lifestyle, and genetic factors as possible risk factors. These include workplace exposures to chemical agents and electromagnetic fields, dietary factors, family history of tumors, genetic factors, home use of selected appliances, reproductive history and hormonal exposures, viruses, and medical and dental exposure to ionizing radiation. Results from these studies will be reported in future publications. Because of intense public interest, cellular phone use is the first report.

*The study is titled, "Cellular-telephone use and brain tumors." The authors are Peter D. Inskip, Robert E. Tarone, Elizabeth E. Hatch, Timothy C. Wilcosky, William R. Shapiro, Robert G. Selker, Howard A. Fine, Peter M. Black, Jay S. Loeffler, and Martha S. Linet. *NEJM* 2001: Vol. 344:79-86. A copy is available on the Web Site at <http://www.nejm.org/content/index.asp>

State-of-the-Art Exhaust Hood

The Howard Hughes Medical Institute will soon publish a Report on the Performance of Laboratory Chemical Hoods. An article is also planned for publication in the AIHA journal.

There is no consensus standard on the design and performance requirements for Laboratory Chemical Hoods. The Institute gathered a team of 24 nationally recognized experts in laboratory ventilation to determine the best design and performance requirements. They focused on four broad topics:

- Hood Selection and use
- Hood design
- Ventilation system design
- Hood performance testing

The experts agreed on 31 consensus statements that describe the four topics mentioned above. Examples of the consensus statements are:

- Training of users in proper use of the hood is essential - information should include details about lab hoods and their selection, design intent, and operation, the user should be trained to use the hood properly and safely, and to be able to tell when the hood is functioning properly
- The nature of the task, the methods and work practices of the lab worker, and the location of the sash are critical to the hood's level of containment.

Topics that are still being developed are:

- Risk assessment guidelines
- A commissioning process for new installations and remodeling

We will provide a summary of their report when it becomes available.

IAQ Tech Tip #47 - Is Mold Contamination a Threat to Health? Part 2 of a 2 Part Series

The following article is part two of a two-part series article that was written by Harriet M. Ammann, Ph.D., D.A.B.T. She is a senior toxicologist for Washington State Department of Health, Office of Environmental Health Assessments. The first half of this article appeared in IAQ Tech Tip #46.

Toxicity

Molds can produce other secondary metabolites such as antibiotics and mycotoxins. Antibiotics are isolated from mold (and some bacterial) cultures and some of their bacteriotoxic or bacteriostatic properties are exploited medicinally to combat infections.

Mycotoxins are also products of secondary metabolism of molds. They are not essential to maintaining the life of the mold cell in a primary way (at least in a friendly world), such as obtaining energy or synthesizing structural components, informational molecules or enzymes. They are products whose function seems to be to give molds a competitive advantage over other mold species and bacteria. Mycotoxins are nearly all cytotoxic, disrupting various cellular structures such as membranes, and interfering with vital cellular processes such as protein, RNA and DNA synthesis. Of course they are also toxic to the cells of higher plants and animals, including humans.

Mycotoxins vary in specificity and potency for their target cells, cell structures or cell processes by the species and strain of the mold that produces them. Higher organisms are not specifically targeted by mycotoxins, but seem to be caught in the crossfire of the biochemical warfare among mold species and molds and bacteria vying for the same ecological niche.

Not all molds produce mycotoxins, but numerous species do (including some found indoors in contaminated buildings). Toxigenic molds vary in their mycotoxin production depending on the substrate on which they grow (Jarvis, 1990). The spores, with which the toxins are primarily associated, are cast off in blooms that vary with the mold's diurnal, seasonal and life cycle stage (Burge, 1990; Yang, 1995). The presence of competitive organisms may play a role, as some molds grown in monoculture in the laboratory lose their toxic potency (Jarvis, 1995). Until relatively recently, mold poisons were regarded with concern primarily as contaminants in foods.

More recently concern has arisen over exposure to multiple mycotoxins from a mixture of mold spores growing in wet indoor environments. Health effects from exposures to such mixtures can differ from those related to single mycotoxins in controlled laboratory exposures. Indoor exposures to toxigenic molds resemble field exposures of animals more closely than they do controlled experimental laboratory exposures. Animals in controlled laboratory exposures are healthy, of the same age, raised under optimum conditions, and have only the challenge of known doses of a single toxic agent via a single exposure route. In contrast, animals in field exposures are of mixed ages, and states of health, may be living in less than optimum environmental and nutritional conditions, and are exposed to a mixture of toxic agents by multiple exposure routes. Exposures to individual toxins may be much lower than those required to elicit an adverse reaction in a small controlled exposure

group of ten animals per dose group. The effects from exposure may therefore not fit neatly into the description given for any single toxin, or the effects from a particular species of mold.

Field exposures of animals to molds (in contrast to controlled laboratory exposures) show effects on the immune system as the lowest observed adverse effect. Such immune effects are manifested in animals as increased susceptibility to infectious diseases. It is important to note that almost all mycotoxins have an immunosuppressive effect, although the exact target within the immune system may differ. Many are also cytotoxic, so that they have route of entry effects that may be damaging to the gut, the skin or the lung. Such cytotoxicity may affect the physical defense mechanisms of the respiratory tract, decreasing the ability of the airways to clear particulate contaminants (including bacteria or viruses), or damage alveolar macrophages, thus preventing clearance of contaminants from the deeper lung. The combined result of these activities is to increase the susceptibility of the exposed person to infectious disease, and to reduce his defense against other contaminants. They may also increase susceptibility to cancer (Jakab et al., 1994).

Because indoor samples are usually comprised of a mixture of molds and their spores, it has been suggested that a general test for cytotoxicity be applied to a total indoor sample to assess the potential for hazard as a rough assessment (Gareis, 1995).

The following summary of toxins and their targets is adapted from Smith and Moss (1985), with a few additions from the more recent literature. While this compilation of effects does not describe the effects from multiple exposures, which could include synergistic effects, it does give a better idea of possible results of mycotoxin exposure to multiple molds indoors.

- Vascular system (increased vascular fragility, hemorrhage into body tissues, or from lung, e.g., aflatoxin, satratoxin, rosidins)
- Digestive system (diarrhea, vomiting, intestinal hemorrhage, liver effects, i.e., necrosis, fibrosis: aflatoxin; caustic effects on mucous membranes: T-2 toxin; anorexia: vomitoxin.
- Respiratory system: respiratory distress, bleeding from lungs e.g., trichothecenes
- Nervous system, tremors, incoordination, depression, headache, e.g., tremorgens, trichothecenes.
- Cutaneous system: rash, burning sensation sloughing of skin, photosensitization, e.g., trichothecenes
- Urinary system: nephrotoxicity, e.g. ochratoxin, citrinin.
- Reproductive system: infertility, changes in reproductive cycles, e.g. T-2 toxin, zearalenone.
- Immune system: changes or suppression: many mycotoxins.

It should be noted that not all mold genera have been tested for toxins, nor have all species within a genus necessarily been tested. Conditions for toxin production varies with cell and diurnal and seasonal cycles and substrate on which the mold

grows, and those conditions created for laboratory culture may differ from those the mold encounters in its environment.

Toxicity can arise from exposure to mycotoxins via inhalation of mycotoxin-containing mold spores or through skin contact with the toxigenic molds (Forgacs, 1972; Croft et al., 1986; Kemppainen et al., 1988 -1989). A number of toxigenic molds have been found during indoor air quality investigations in different parts of the world. Among the genera most frequently found in numbers exceeding levels that they reach outdoors are *Aspergillus*, *Penicillium*, *Stachybotrys*, and *Cladosporium* (Burge, 1986; Smith et al., 1992; Hirsh and Sosman, 1976; Verhoeff et al., 1992; Miller et al., 1988; Gravesen et al., 1999). *Penicillium*, *Aspergillus* and *Stachybotrys* toxicity, especially as it relates to indoor exposures, will be discussed briefly in the paragraphs that follow.

Penicillium

Penicillium species have been shown to be fairly common indoors, even in clean environments, but certainly begin to show up in problem buildings in numbers greater than outdoors (Burge, 1986; Miller et al., 1988; Flannigan and Miller, 1994). Spores have the highest concentrations of mycotoxins, although the vegetative portion of the mold, the mycelium, can also contain the poison. Viability of spores is not essential to toxicity, so that the spore as a dead particle can still be a source of toxin.

Important toxins produced by penicillia include nephrotoxic citrinin, produced by *P. citrinum*, *P. expansum* and *P. viridicatum*; nephrotoxic ochratoxin, from *P. cyclopium* and *P. viridicatum*, and patulin, cytotoxic and carcinogenic in rats, from *P. expansum* (Smith and Moss, 1985).

Aspergillus

Aspergillus species are also fairly prevalent in problem buildings. This genus contains several toxigenic species, among which the most important are, *A. parasiticus*, *A. flavus*, and *A. fumigatus*. Aflatoxins produced by the first two species are among the most extensively studied mycotoxins. They are among the most toxic substances known, being acutely toxic to the liver, brain, kidneys and heart, and with chronic exposure, potent carcinogens of the liver. They are also teratogenic (Smith and Moss, 1985; Burge, 1986). Symptoms of acute aflatoxicosis are fever, vomiting, coma and convulsions (Smith and Moss, 1985). *A. flavus* is found indoors in tropical and subtropical regions, and occasionally in specific environments such as flowerpots. *A. fumigatus* has been found in many indoor samples. A more common *aspergillus* species found in wet buildings is *A. versicolor*, where it has been found growing on wallpaper, wooden floors, fibreboard and other building material. *A. versicolor* does not produce aflatoxins, but does produce a less potent toxin, sterigmatocystin, an aflatoxin precursor (Gravesen et al., 1994). While symptoms of aflatoxin exposure through ingestion are well described, symptoms of exposure such

as might occur in most moderately contaminated buildings are not known, but are undoubtedly less severe due to reduced exposure. However, the potent toxicity of these agents advise that prudent prevention of exposures are warranted when levels of aspergilli indoors exceed outdoor levels by any significant amount. *A. fumigatus* has been found in many indoor samples. This mold is more often associated with the infectious disease aspergillosis, but this species does produce poisons for which only crude toxicity tests have been done (Betina, 1989). Recent work has found a number of tremorgenic toxins in the conidia of this species (Land et al., 1994). *A. ochraceus* produces ochratoxins (also produced by some penicillia as mentioned above). Ochratoxins damage the kidney and are carcinogenic (Smith and Moss, 1985).

***Stachybotrys chartarum* (atra)**

Stachybotrys chartarum (atra) has been much discussed in the popular press and has been the subject of a number of building related illness investigations. It is a mold that is not readily measured from air samples because its spores, when wet, are sticky and not easily aerosolized. Because it does not compete well with other molds or bacteria, it is easily overgrown in a sample, especially since it does not grow well on standard media (Jarvis, 1990). Its inability to compete may also result in its being killed off by other organisms in the sample mixture. Thus, even if it is physically captured, it will not be viable and will not be identified in culture, even though it is present in the environment and those who breathe it can have toxic exposures. This organism has a high moisture requirement, so it grows vigorously where moisture has accumulated from roof or wall leaks, or chronically wet areas from plumbing leaks. It is often hidden within the building envelope. When *S. chartarum* is found in an air sample, it should be searched out in walls or other hidden spaces, where it is likely to be growing in abundance. This mold has a very low nitrogen requirement, and can grow on wet hay and straw, paper, wallpaper, ceiling tiles, carpets, and insulation material (especially cellulose-based insulation). It also grows well when wet filter paper is used as a capturing medium.

S. chartarum has a well-known history in Russia and the Ukraine, where it has killed thousands of horses, which seem to be especially susceptible to its toxins. These toxins are macrocyclic trichothecenes. They cause lesions of the skin and gastrointestinal tract, and interfere with blood cell formation. (Sorenson, 1993). Persons handling material heavily contaminated with this mold describe symptoms of cough, rhinitis, burning sensations of the mouth and nasal passages and cutaneous irritation at the point of contact, especially in areas of heavy perspiration, such as the armpits or the scrotum (Andrassy et al., 1979).

One case study of toxicosis associated with macrocyclic trichothecenes produced by *S. chartarum* in an indoor exposure has been published (Croft et al., 1986), and has proven seminal in further investigations for toxic effects from molds found indoors. In this exposure of a family in a home with water damage from a leaky roof, complaints included (variably among family members and a maid): headaches, sore

throats, hair loss, flu symptoms, diarrhea, fatigue, dermatitis, general malaise, psychological depression. (Croft et al, 1986; Jarvis, 1995).

Johanning, (1996) in an epidemiological and immunological investigation, reports on the health status of office workers after exposure to aerosols containing *S. chartarum*. Intensity and duration of exposure was related to illness. Statistically significant differences for more exposed groups were increased lower respiratory symptoms, dermatological, eye and constitutional symptoms, chronic fatigue, and allergy history. Duration of employment was associated with upper respiratory, skin and central nervous system disorders. A trend for frequent upper respiratory infections, fungal or yeast infections, and urinary tract infections was also observed. Abnormal findings for components of the immune system were quantified, and it was concluded that higher and longer indoor exposure to *S. chartarum* results in immune modulation and even slight immune suppression, a finding that supports the observation of more frequent infections.

Three articles describing different aspects of an investigation of acute pulmonary hemorrhage in infants, including death of one infant, have been published recently, as well as a CDC evaluation of the investigation (Montaña et al., 1997; Etzel et al., 1998; Jarvis et al., 1998; MMWR, 2000; CDC, 1999). The infants in the Cleveland outbreak were reported with pulmonary hemosiderosis, a sign of an uncommon of lung disease that involves pulmonary hemorrhage. *Stachybotrys chartarum* was shown to have an association with acute pulmonary bleeding. Additional studies are needed to confirm association and establish causality.

Animal experiments in which rats and mice were exposed intranasally and intratracheally to toxic strains of *S. chartarum*, demonstrated acute pulmonary hemorrhage (Nikkulin et al. 1996). A number of case studies have been more recently published. One involving an infant with pulmonary hemorrhage in Kansas, reported significantly elevated spore counts of *Aspergillus/Penicillium* in the patient's bedroom and in the attic of the home. *Stachybotrys* spores were also found in the air of the bedroom, and the source of the spores tested highly toxigenic. (Flappan et al., 1999). In another case study in Houston, *Stachybotrys* was isolated from bronchopulmonary lavage fluid of a child with pulmonary hemorrhage. (Elidemir et al., 1999), as well as recovered from his water damaged-home. The patient recovered upon removal and stayed well after return to a cleaned home. Another case study reported pulmonary hemorrhage in an infant during induction of general anesthesia. The infant was found to have been exposed to *S. chartarum* prior to the anesthetic procedure (Tripi et al., 2000). Still another case describes pulmonary hemorrhage in an infant whose home contained toxigenic species of *Penicillium* and *Trichoderma* (a mold producing trichothecene poisons similar to the ones produced by *S. chartarum*) as well as tobacco smoke (Novotny and Dixit, 2000)

Toxicologically, *S. chartarum* can produce extremely potent trichothecene poisons, as evidenced by one-time lethal doses in mice (LD50) as low as 1.0 to 7.0 mg/kg, depending on the toxin and the exposure route. Depression of immune response,

and hemorrhage in target organs are characteristic for animals exposed experimentally and in field exposures (Ueno, 1980; Jakab et al., 1994).

While there are insufficient studies to establish cause and effect relationships between *Stachybotrys* exposure indoors and illness, including acute pulmonary bleeding in infants, toxic endpoints and potency for this mold are well described. What is less clear, and has been difficult to establish, is whether exposures indoors are of sufficient magnitude to elicit illness resulting from toxic exposure.

Some of these difficulties derive from the nature of the organisms and the toxic products they produce and varying susceptibilities among those exposed. Others relate to problems common to retrospective case control studies. Some of the difficulties in making the connection between toxic mold exposures and illness are discussed below.

Limitations in Sampling Methodology, Toxicology, and Epidemiology of Toxic Mold Exposure.

Some of the difficulties and limitations encountered in establishing links between toxic mold contaminated buildings and illness are listed here:

- Few toxicological experiments involving mycotoxins have been performed using inhalation, the most probable route for indoor exposures. Defenses of the respiratory system differ from those for ingestion (the route for most mycotoxin experiments). Experimental evidence suggests the respiratory route to produce more severe responses than the digestive route (Cresia et al., 1987)
- Effects from low level or chronic low level exposures, or ingestion exposures to mixtures of mycotoxins, have generally not been studied, and are unknown. Effects from high level, acute sub-acute and sub-chronic ingestion exposures to single mycotoxins have been studied for many of the mycotoxins isolated. Other mycotoxins have only information on cytotoxicity or in vitro effects.
- Effects of multiple exposures to mixtures of mycotoxins in air, plus other toxic air pollutants present in all air breathed indoors, are not known.
- Effects of other biologically active molecules, having allergic or irritant effects, concomitantly acting with mycotoxins, are not known.
- Measurement of mold spores and fragments varies, depending on instrumentation and methodology used. Comparison of results from different investigators is rarely, if ever, possible with current state of the art.
- While many mycotoxins can be measured in environmental samples, it is not yet possible to measure mycotoxins in human or animal tissues. For this reason exposure measurements rely on circumstantial evidence such as presence of contamination in the patient's environment, detection of spores in air, combined

with symptomology in keeping with known experimental lesions caused by mycotoxins, to establish an association with illness.

- Response of individuals exposed indoors to complex aerosols varies depending on their age, gender, state of health, and genetic make-up, as well as degree of exposure.
- Microbial contamination in buildings can vary greatly, depending on location of growing organisms, and exposure pathways. Presence in a building alone does not constitute exposure.
- Investigations of patients' environments generally occur after patients have become ill, and do not necessarily reflect the exposure conditions that occurred during development of the illness. All cases of inhalation exposure to toxic agents suffer from this deficit. However, exposures to chemicals not generated biologically can sometimes be re-created, unlike those with active microbial growth. Indoor environments are dynamic ecosystems that change over time as moisture, temperature, food sources and the presence of other growing microorganisms change. Toxin production particularly changes with age of cultures, stage of sporulation, availability of nutrients, moisture, and the presence of competing organisms. After-the-fact measurements of environmental conditions will always reflect only an estimate of exposure conditions at the time of onset of illness. However, presence of toxigenic organisms, and their toxic products, are indicators of putative exposure, which together with knowledge of lesions and effects produced by toxins found, can establish association.

Conclusions and Recommendations

Prudent public health practice then indicates removal from exposure through clean up or remediation, and public education about the potential for harm. Not all species within these genera are toxigenic, but it is prudent to assume that when these molds are found in excess indoors that they are treated as though they are toxin producing. It is not always cost effective to measure toxicity, so cautious practice regards the potential for toxicity as serious, aside from other health effects associated with excessive exposure to molds and their products. It is unwise to wait to take action until toxicity is determined after laboratory culture, especially since molds that are toxic in their normal environment may lose their toxicity in laboratory monoculture over time (Jarvis, 1995) and therefore may not be identified as toxic. While testing for toxins is useful for establishing etiology of disease, and adds to knowledge about mold toxicity in the indoor environment, prudent public health practice might advise speedy clean-up, or removal of a heavily exposed populations from exposure as a first resort.

Health effects from exposures to molds in indoor environments can result from allergy, infection, mucous membrane and sensory irritation and toxicity alone, or in combination. Mold growth in buildings (in contrast to mold contamination from the

outside) always occurs because of unaddressed moisture problems. When excess mold growth occurs, exposure of individuals, and remediation of the moisture problem must be addressed.

References for this article are located at:

<http://www.doh.wa.gov/ehp/oehas/mold.html>

Why Are Indoor Air Quality Problems So Prevalent Today?

The Environmental Protection Agency indicates that many Americans spend up to 90 percent of their time indoors. Contributions to IAQ problems today are:

- Societies increase in information-based technology and services, which means more time spent in the office environment
- The increase in office appliances, which produced greater demands in ventilation
- The changing of HVAC systems, which limit personal control of occupant workspace
- New construction materials and technologies that bring problems such as fiberglass shedding and off-gassing of volatile organic compounds
- Research being conducted on specific aspects of IAQ, resulting in media attention and involvement of the legal community

And the last two factors are personal attitude (people are not as willing to accept the contention that ill health is a normal part of the job) and the ability to access information resources.

These are working individually and in conjunction with one another to keep IAQ in the forefront of today's workplace.

Welding Fumes Could Trigger Parkinson's Onset

Inhaling fumes from welding operations could trigger the early onset of Parkinson's disease, according to results of a preliminary study.

Dr. Brad A. Racette and colleagues from Washington University Medical School in St. Louis, Mo., found that 15 professional welders with Parkinson's developed signs of the disease an average of 15 years earlier than non-welders diagnosed with Parkinson's.

The results of the study were published in January 9, 2001 issue of the journal *Neurology*.

Parkinson's disease is a progressive disease of the nervous system, characterized by tremors and impaired movement. It affects more than 1 million Americans.

A decrease in the production of dopamine, a critical brain chemical, is responsible for the symptoms of Parkinson's disease.

About 80 percent of Parkinson's disease patients have no family history of the disease, so scientists theorize that environmental factors also play a role in the development of the disease.

The researchers compared the clinical symptoms of 15 professional welders with those of Parkinson's disease patients who were not welders.

They found no difference between the welder's symptoms and those of the non-welders, with one exception: the average age of onset for the welders was 40 years -- about 15 years younger than the average age of onset of the non-welders group.

INTERNET NEWS

Merck Manual on line

The Merck manual is now on line, see <http://www.merck.com/pubs/mmanual>

INDUSTRIAL HYGIENE PROFESSIONAL NEWS

Voluntary Industry Standard Released For Public Comment; Decade in Development

A proposed voluntary consensus standard on ergonomics --under development for 10 years--is now available for formal public review and comment until March 13, the National Safety Council announced. The Accredited Standards Committee on Control of Cumulative Trauma Disorders (Z-365) developed the proposed standard, Management of Work-Related Musculoskeletal Disorders.

The proposed standard on ergonomics is a voluntary guide for occupational safety and health professionals charged with controlling work-related cumulative trauma disorders, according to NCS. The committee, for which NSC serves as the secretariat, is comprised of representatives from business, labor, academia, and professional societies.

The latest copy of the proposed voluntary standard is available from the NSC at 1-800-621-7619, or www.nsc.org/products/lrs/Z365.cfm. The entire standard is open for public comment.

OSHA Administrator Suggestion

AIHA has sent a letter to Labor Secretary-Designate Elaine Chao advocating the nomination of John Henshaw as OSHA administrator, see <http://www.aiha.org/syn.html>

AIHCE

The American Industrial Hygiene, Conference & Expo, will be held from June 2 - 7, 2001 -- New Orleans, Louisiana. Attendees can only register via the Internet: see <http://www.aiha.org/conf.html>

Comprehensive Certification Survey

The American Board of Industrial Hygiene (ABIH) has begun discussing the potential and need for a comprehensive certification covering the larger area of practice, which includes Safety, Health (Industrial Hygiene) and the Environment. Since there are existing accredited certification boards within these disciplines, the ABIH, BCSP and IPEP have been considering whether a joint venture would accomplish this goal.

Of the options explored, the following appear at this time to be the most feasible:

1. create a separate, flexible certification program, along the lines of the ABIH/BCSP Council on Certification of Health, Environmental and Safety Technologists, or
2. develop an agreement among our organizations for awarding a certification to individuals who have some level of certification with all three organizations.

The ABIH would like your opinions and comments and have set up an online survey to solicit responses on the issue. The BCSP is also conducting a similar survey among its certificate holders. See <http://www.abih.org/Docs/EHS-needs.htm>

ANSI/AIHA Seek Comments on Ventilation Standard

The ANSI / AIHA Z9.5 - 1992 Laboratory Ventilation standard is being revised. This standard describes practices for the design and operation of laboratory ventilation systems used for control of exposure to airborne contaminants. To obtain a copy contact AIHA at (703)-849-8888 the cost is \$10 per copy.

SEI Tests and Certifies Safety Equipment

The Safety Equipment Institute (SEI) is a private, non-profit organization to administer non-governmental, third party programs to test and certify many types of safety equipment products. ANSI accredits SEI. SEI certifies equipment when:

- The independent testing laboratory, using extensive sampling as specified by Military Standard 414, has determined the product model meets selected product standards; and
- An on-location audit, conducted by an independent quality assurance auditor, has verified the manufacturer complies with SEI quality assurance requirements governing consistency of production.

A list of the equipment types and other information about SEI is available online at www.seinet.org.

NIOSH Releases Product Guide on CD-ROM

The 2000 CD-ROM edition of the NIOSH Pocket Guide to Chemical Hazards and Other Databases provides the following databases:

- Immediately Dangerous to Life and Health Concentrations
- International Chemical Safety Cards
- NIOSH Manual of Analytical Methods
- NIOSH Pocket Guide to Chemical Hazards
- OSHA Sampling and Analytical Methods
- Recommendations for Chemical Protective Clothing
- Specific Medical Tests Published in the Literature for OSHA Regulated Substances
- Toxicologic Review of Selected Chemicals
- 2000 Emergency Response Guidebook

To order, contact NIOSH at (202) 512-1800, <http://bookstore.gpo.gov>.

PUBLICATIONS

NIOSH Back Belt Guidance

For the most recent pamphlet on the NIOSH Back belt guidance see:
<http://www.cdc.gov/niosh/backbelt.html>

CDC's Ebola Hemorrhagic Fever Fact Sheet

For the most recent CDC guidance on Ebola see:
<http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/ebola.htm>

Resource Guide for Small Businesses

The Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) offers a new guide to help small businesses locate services and resources for preventing job-related injuries and illnesses. ["Safety and Health Resource Guide for Small Businesses."](#) DHHS (NIOSH) Publication No. 2000-148, is the first such compendium designed expressly for small businesses. It lists sources of free occupational health and safety information from government agencies, professional associations and other organizations. The listings include telephone numbers, fax numbers, web addresses, mailing addresses, and other details to help small businesses find information quickly and easily.

JUST THE FACTS

CONFINED SPACE

A federal appeals court found the Secretary of Labor's interpretation that an elevator pit qualifies as a confined space.

COMPLIANCE

Federal contracting officers will have to take into account a prospective contractor's record of compliance with labor, safety, and several other nonprocurement-related laws when awarding federal contracts. Amendments to the Federal Acquisition Regulation go into effect Jan. 19.

Workers Had Potential for Fall Exposure, was Out of Monitor's Sight

Peter Miller Inc. a roofing contractor was cited by OSHA for two violations (1) allowing employees to get within six feet of the edge of a roof, and (2) not providing employees with any PPE. An administrative law judge affirmed the citation. The contractor appealed to the OSH Review Commission on the issue that whether the judge erred in finding there was employee exposure and whether the safety monitor failed to satisfy the requirements of the standard.

A worker was near six feet of the roof's edge without the use of fall protection and being monitored by a safety monitor. There was a safety monitor at the site though not on the same level as the worker.

Reviewing the record, it showed that the worker was more than six feet away from the edge; certain circumstances could have caused the worker to stumble placing the worker within the roof edge and the six feet distance, "it was reasonably predictable that the worker would enter the zone of danger." The safety monitor was above the worker which the standard states "clearly and unambiguously required the safety monitor to be on the same surface as the employee/s being monitored." The commission upheld the citation.

31 Lawsuits Filed Challenging Ergonomics Rule

The number of lawsuits challenging OSHA's controversial ergonomics standard has risen to 31. The deadline for filing suit was Jan. 12. The courts consolidated all the cases under the National Association of Manufacturers lead case.

The OSHA list, as of Jan. 25, shows that labor unions filed six petitions and individual industry challenges tallied 25, although numerous member companies supported several associations. For example, more than 100 insurance companies joined in a suit filed by American Indemnity Co. The National Coalition on Ergonomics noted that more than 50 other trade associations and companies joined in its petitions.

Petitioners have until Feb. 15 to file statements of issue and docketing statements, according to the agency desk of the D.C. Circuit. In addition, OSHA must file the certification index to the record of the case by March 2.

Noise

- Noise-induced hearing loss is 100 percent preventable. Once acquired, hearing loss is permanent and irreversible.
- Approximately 30 million workers are exposed to hazardous noise on the job and an additional nine million are at risk for hearing loss from other agents such as solvents and metals.
- Noise-induced hearing loss is one of the most common occupational diseases and the second most self-reported occupational illness or injury. Industry specific studies reveal:
 - ✓ 44% of carpenters and 48% of plumbers reported that they had a perceived hearing loss.
 - ✓ 90% of coal miners will have a hearing impairment by age 52 (compared to 9% of the general population); 70% of male, metal/nonmetal miners will experience a hearing impairment by age 60.
- Industries with high numbers of exposed workers include: agriculture; mining; construction; manufacturing and utilities; transportation; and military.
- The U.S. Army **saved** \$504.3 million by reducing hearing loss among combat arms personnel between 1974 and 1994. Between 1987 and 1997, as a result of military efforts to reduce civilian hearing loss, the Department of Veterans Affairs saved \$220.8 million and the Army an additional \$149 million.
- Removing hazardous noise from the workplace through engineering controls (e.g. installing a muffler or building an acoustic barrier) is the most effective way to prevent noise-induced hearing loss.
- Hearing protectors such as ear plugs and ear muffs should be used when it is not feasible to otherwise reduce noise to a safe level. NIOSH recommends hearing loss prevention programs for all workplaces with hazardous levels of noise. These programs should include noise assessments, engineering controls, audiometric monitoring of workers' hearing, appropriate use of hearing protectors, worker education, recordkeeping, and program evaluation.

ARMY ITEMS OF INTEREST - None

ADMINISTRATIVE INFORMATION

This document was prepared for the U.S. Army Center for Health Promotion and Preventive Medicine (USACHP) PM), Directorate of Occupational Health Sciences. The POC at the USACHPPM is Mrs. Sandra Monk; Program Manager; Industrial Hygiene Management Program; DSN: 584-2439; COM: 410. 436.2439; e-mail: Sandra.Monk@apg.amedd.army.mil.

This document summarizes information and regulatory actions that are relevant for Army Industrial Hygiene Program personnel. We distribute this summary in electronic form only. Please make it available to your staff if they do not have direct access to an electronic copy. A copy is posted on the Army IH Program Home Page (<http://chppm-www.apgea.army.mil/Armyih>). If you would like to be added to the electronic mailing list or if your e-mail address changes, please contact Tammy Budkey, e-mail: tammy.budkey@apg.amedd.army.mil; or call her at DSN: 584-2439; COM: 410.436.2439; fax: 410.436.8795.

At a minimum; we review the following publications in preparing this summary: [AIHA Journal](#); the [Synergist](#); The [AAIH Newsletter](#); OSHA Week; the [Federal Register](#); BNA OSHA Reporter; The [Journal of Occupational and Environmental Medicine](#); The [Journal of Environmental Health](#); [Professional Safety](#); Safety and Health, [Occupational Hazards](#); [Occupational Health and Safety](#); and [Industrial Safety and Hygiene News](#). We also gather information from a variety of sources on the Internet using the Army IH Program Home Page as our gateway. (<http://chppm-www.apgea.army.mil/Armyih/>).

If you have questions or comments; please contact Jim Evenden at jevenden@lmi.org; 410.638.2081/2086 (voice) or 2093 (fax).